dimensional images, as well. One approach is to measure the position of the viewer, and perform real time parallax correction on the displayed image. This technique could be used, for example, as a way of making a wall display appear as a window into an adjacent room or portion of a room. A full wall display could give the illusion of being part of a single, contiguous, larger space. A outside viewed hemispherical display could appear to be three dimensional physical object, viewable from any angle.

Binocular cues could be provided by supplying each eye with a different image. Standard approaches to this problem include frame triggered shutters for each eye, projected polarization control, red/blue colored glasses. Another approach may be to project six colors, using distinct narrow band color filters for each eye.

Auxiliary Technologies

There are a variety of auxiliary ideas which complement the high resolution displays described here. Some examples include the incorporation of pen or finger locating techniques along with the display as a way of providing user input to a computer system using such displays.

For example, finger position may be sensed by using the change in the reflective characteristics of ground glass when a finger is placed over a portion of the glass. The presence of the finger dramatically changes the amount of light reflected from the surface of the glass, potentially allowing a sensor to detect the light change from the rear reflected image.

Along with the finger location sensor is the use of a fiducial marker displayed offset from the finger (perhaps a centimeter above the finger) as a way of providing high accuracy pointing, while avoiding covering the display with the finger being used to point. Such an "offset pointing" technology may be useful in more conventional application areas.

In a further embodiment, calibration may be performed dynamically by stealing frames, i.e., taking an occasional frame or portion thereof and rather than displaying the usual picture, displaying a calibration pattern.

In yet another embodiment, a display output may be modified to account for some obstruction, possibly a moving obstruction, for a given viewpoint.

Another embodiment employs the aforementioned techniques to correct for various types of distortion.

Finally, the present invention may be used where the projected image changes from frame to frame, as, for example, in a movie or an animation.

While this invention has been particularly shown and described with references to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A method of displaying images comprising:

selectively projecting pixels from a projector onto a projection surface;

sensing the pixels as projected across the projection surface;

deriving a projector/screen mapping based on the selected pixels and the sensed pixels;

deriving a pixel correction function based on the projector/screen mapping;

storing the pixel correction function as a lookup table;

applying the pixel correction function to input image pixel data to produce corrected pixel data which corrects at least for misalignment; and

driving the projector with the corrected pixel data.

2. A method as claimed in claim **1** wherein the pixel correction function corrects for misalignment of plural projections in a common region.

3. A method as claimed in claim **1** wherein the pixel correction function corrects for intensity variations across a projected image.

4. The method of claim **1** wherein the pixel correction function corrects for imperfections across a projected image.

5. The method of claim **1** wherein the pixel correction function corrects for chromatic aberration.

6. The method of claim **1** wherein the pixel correction function corrects for rotational distortion.

7. The method of claim **1** wherein the pixel correction function performs smooth warping of the input image.

8. The method of claim **1** wherein a portion of the input image is generated by at least one of a VCR, laser disc and a computer.

9. The method of claim **1** further comprising, between the steps of storing a pixel correction function and applying the pixel correction function, the step of storing pixel data in a frame buffer, such that the pixel correction function is applied to the pixel data between the frame buffer and the projector.

10. The method of claim **1** further comprising, between the steps of applying the pixel correction function and driving the projector, the step of storing the corrected pixel data in a frame buffer, such that the projector is driven from the corrected pixel data in the frame buffer.

11. The method of claim **1** wherein the plural projectors are provided, each with a respective frame buffer.

12. The method of claim **11** wherein the pixel correction function corrects for misalignment of overlapping pixel arrays.

13. The method of claim **11** wherein the pixel correction function blends overlapping projection regions.

14. The method of claim **11** wherein a separate frame buffer is provided for each of plural colors in each of plural adjacent projection regions.

15. The method of claim **11** wherein the plural projectors have a small fill factor and the projected images fully overlap.

16. The method of claim **11** wherein the pixel correction function corrects for color mismatch across a projected image.

17. The method of claim **1** wherein a separate frame buffer is provided for each of plural colors.

18. The method of claim **1** wherein the projector output is sensed by an optical sensor that is displaced from the projection surface.

19. The method of claim **18** wherein the optical sensor comprises a pair of orthogonal linear sensor arrays.

20. The method of claim **18** wherein the optical sensor comprises at least one camera.

21. The method of claim **18**, wherein deriving the projector/screen mapping comprises:

deriving a sensor/screen mapping;

deriving a projector/sensor mapping; and

deriving the projector/screen mapping by composing the sensor/screen mapping with the projector/sensor mapping.

22. The method of claim **21**, wherein deriving the sensor/screen mapping comprises:

positioning a calibration test chart at the projection surface, and

creating a mapping between pixels in sensor space and projection surface positions by viewing the test chart with the optical sensor.